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U.S. DEPARTMENT OF LABOR

WORKPLACE STANDARDS ADMINISTRATION
Bureau of Labor Standards

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MATERIAL SAFETY DATA SHEET

SECTION I

MANUFACTUER'S NAME: Monsanto Company	EMERGENCY TELEPHONE NO.: Texas City, 713-945-4431
ADDRESS (Number, Street, City, State, and ZIP Code): 800 North Lindbergh Boulevard, St. Louis, Missouri 63166	
CHEMICAL NAME AND SYNONYMS: Styrene, Vinyl Benzene	TRADE NAME AND SYNONYMS: Styrene Monomer, SM
CHEMICAL FAMILY: Aromatic Hydrocarbon	FORMULA: $C_6H_5CHCH_2$

SECTION II HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES	%	TLV (Units)

SECTION III PHYSICAL DATA

BOILING POINT (°F.)	293	SPECIFIC GRAVITY (H_2O = 1) 77°F(25°C)	.902
VAPOR PRESSURE (mm Hg.) 68°F(20°C)	4.5	PERCENT VOLATILE BY VOLUME (%)	100
VAPOR DENSITY (AIR = 1)	3.6	EVAPORATION RATE (Ether = 1)	<1
SOLUBILITY IN WATER 68°F(20°C)	.029%		
APPEARANCE AND ODOR: Colorless liquid with aromatic odor. Becomes irritating above 400 ppm.			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used): Tag, closed cup 88°F (31°C); Tag, open cup 98°F(37°C).	FLAMMABLE LIMITS Vol. %	LEL 1.1	UEL 6.1
EXTINGUISHING MEDIA: Dry Chemical, Water Fog, Foam or CO_2			
SPECIAL FIRE FIGHTING PROCEDURES: Equipment which handles or contains styrene monomer should be cooled by water stream if exposed to fire.			
UNUSUAL FIRE AND EXPLOSION HAZARDS: None.			

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SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: 100 ppm

EFFECTS OF OVEREXPOSURE: Irritation to eyes and respiratory tract normally provides good warning above 400ppm and systemic injury unlikely unless concentration extremely high (1% can be fatal in 30-60 min.)

EMERGENCY AND FIRST AID PROCEDURES: Move patient to fresh air and revive if unconscious. Call physician immediately. Ingestion: Induce vomiting at least three times with milk and raw eggs. Inhalation: Lie down and keep warm; O_2 relieves coughing. Eye Contact: Irrigate 15 min. with water. Skin: Wash thoroughly with soap and water.

SECTION VI REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		
	STABLE	X	

INCOMPATABILITY (Materials to avoid): Alkylation Catalysts (H_2SO_4, H_3PO_4, BF_3, $AlCl_3$), Halogens, Hydrogen Halides, NaOH, Glycols (Removes Inhibitor).

HAZARDOUS DECOMPOSITION PRODUCTS: Acrid fumes on heating.

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR	X	Excessive heat will deplete inhibitor (runaway polymerization usually requires >150°F)
	WILL NOT OCCUR		

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: All spills and leaks should be immediately flushed to waste treatment facilities with large amounts of water. If water is not available, styrene monomer may be absorbed by dry earth or equivalent and hauled to a disposal area.

WASTE DISPOSAL METHOD: All quantities of styrene monomer or waste contaminated by styrene should be safely burned in a manner consistent with federal, state and local health and pollution regulations. Water containing styrene should be air blown and the air burned if contamination is gross.

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type): Bureau of Mines approved industrial canister gas masks up to 2%. Air or O_2 supplied full face masks above 2%.

VENTILATION		
	LOCAL EXHAUST	SPECIAL
	MECHANICAL (General)	OTHER: Good natural ventilation normally sufficient.

PROTECTIVE GLOVES: Rubber or insoluble plastic.

EYE PROTECTION: Chemical safety goggles if eye contact possible.

OTHER PROTECTIVE EQUIPMENT: Rubber boots and slicker suit if splashing likely.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: For storage temp. below 70°F, check inhibitor and polymer content weekly. If above 70°F, check daily or as experience indicates. Maintain TBC inhibitor above 10 ppm. Keep vents and flame arrestors polymer free. Do not use copper or copper alloys in styrene service. Rubber hose not recommended for styrene transfer.
Other precautions: Avoid skin and eye contact; avoid inhalation of vapors; avoid ingestion.

TOXICITY INFORMATION ON: STYRENE MONOMER

TOXICITY

The rat acute oral LD_{50} of undiluted styrene monomer is 4.37 grams/kilogram. When undiluted styrene monomer was held in continuous 24-hour contact with rabbit skin, the dermal LD_{50} was estimated to be greater than 5.01 grams/kilogram. Thus, styrene monomer is considered to be slightly toxic by ingestion in single doses and by single dermal applications.

When 0.1 milliliter of undiluted styrene monomer was placed into the conjunctival sac of the rabbit eye, a slight degree of irritation resulted. The average score of the 24-, 48- and 72-hour readings was 10.3 on a scale of 110.0. All eyes had regained a normal appearance 120 hours after they were dosed.

A mild degree of irritation resulted when 0.5 milliliter styrene monomer was held in continuous 24-hour contact with intact and abraded rabbit skin. The Primary Irritation Index was 2.4 on a scale of 8.0.

A styrene monomer, at ambient temperature, is capable of producing vapor concentrations which could be lethal. Two of six rats exposed to an atmosphere containing 14.0 milligrams/liter styrene monomer vapor died within 6 hours from the beginning of the exposure. Two additional rats died 4 to 6 days after exposure.

HANDLING PRECAUTIONS

Care should be taken to avoid contact with the eyes. In case of eye contact, flush immediately with large volumes of water. If irritation persists, consult a physician.

Repeated or prolonged skin contact with styrene monomer should be avoided. In case of skin contact, wash affected area thoroughly with soap and water.

Exposure to styrene monomer vapor concentrations should be avoided by handling this material only in a well-ventilated area or with adequate respiratory protection. Should exposure to concentrated vapors occur, remove afflicted person to fresh air and summon a physician immediately.

Styrene monomer appears to possess no other acute toxicologic properties which would require special handling other than the good hygienic practices employed with any industrial chemical.

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